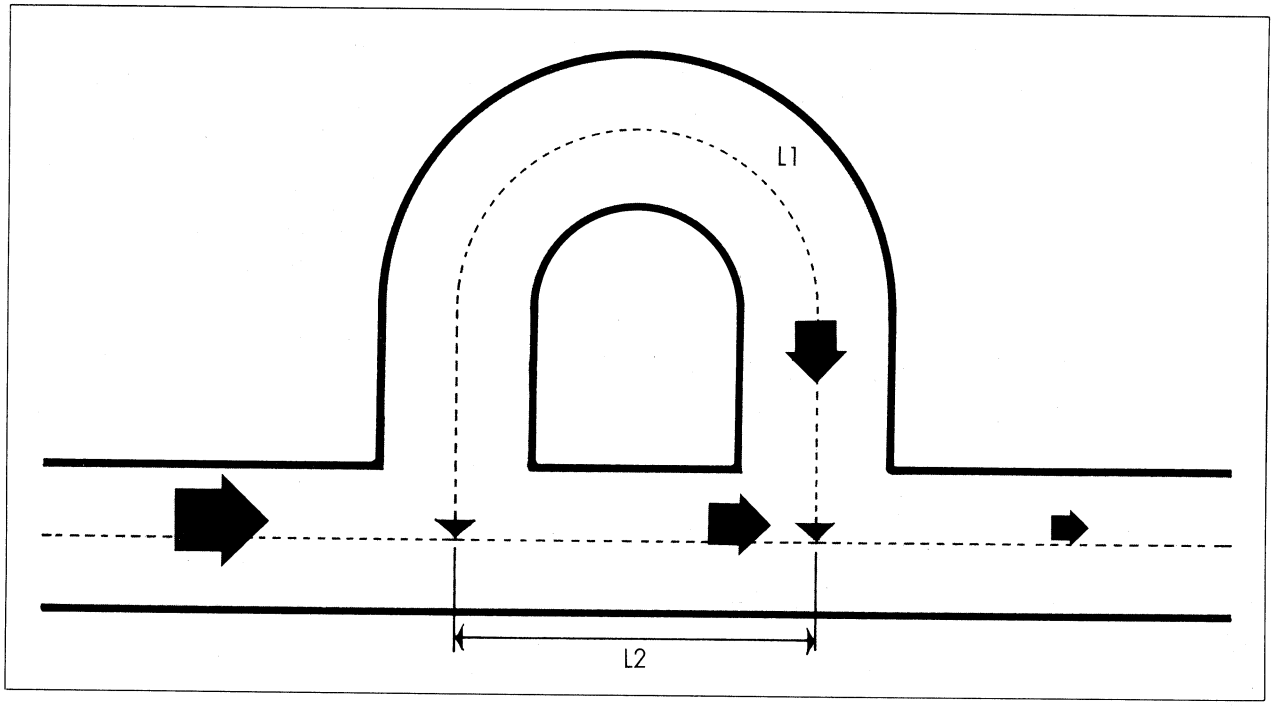
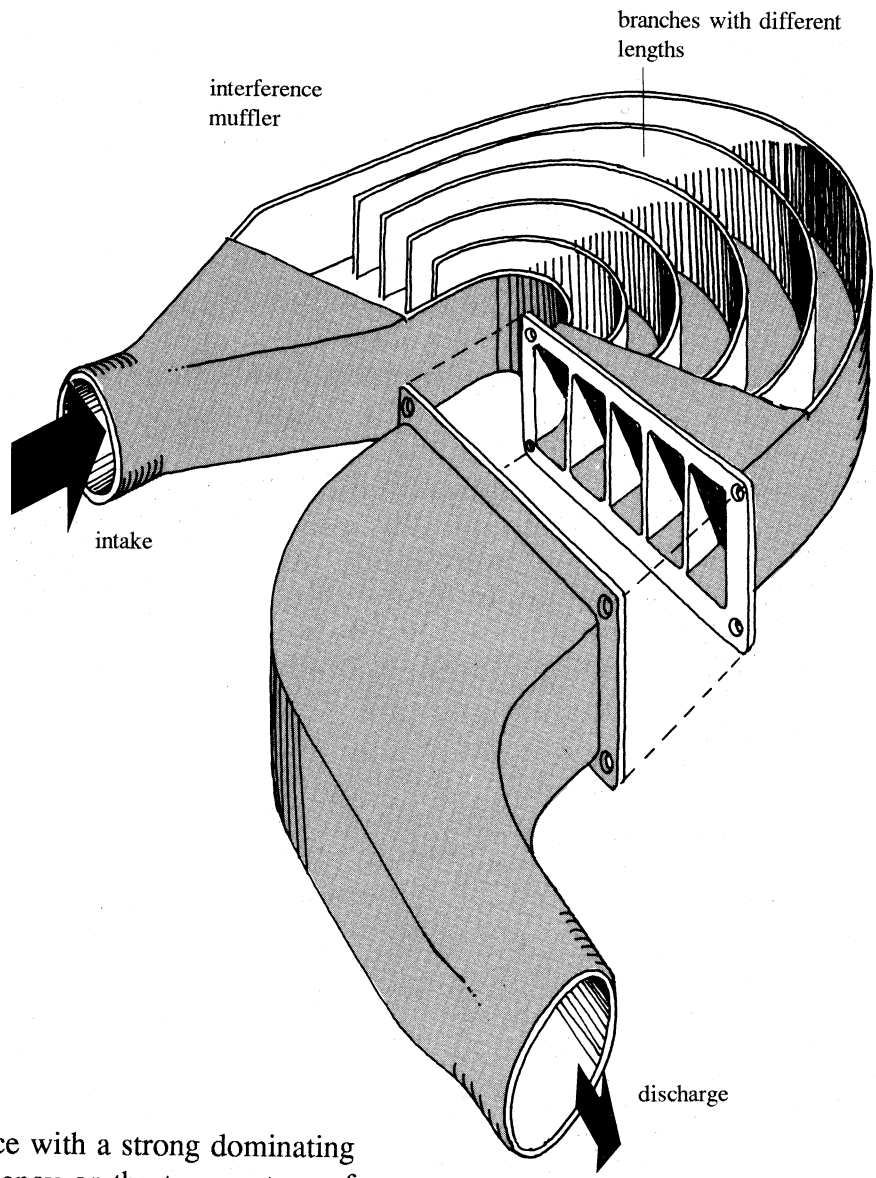
PURE TONES CAN BE ELIMINATED BY CANCELLING SOUND

When the sound contains only a single tone, or several tones within a narrow frequency range, the tone(s) can be wholly or partially eliminated in an interference muffler. This type of muffler utilizes one or more side branches through which the sound travels a longer path, so that it interferes with the sound traveling straight through the duct. In the simplest configuration, as seen in the figure below, the path difference, L1 – L2, determines the frequency for which the muffler is effective. The time–delayed sound cancels the direct sound.

Principle



Application for noise with a strong pure tone



Example

A silencer for a sound source with a strong dominating tone. When the tone's frequency or the temperature of the gas in the duct are not steady, the frequency range over which the muffler is effective may be broadened due to variations in the path length differences between side branches. In this case, the reduction for a single pure tone is somewhat lower. Interference mufflers are most useful for motors which operate at a constant speed.